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GEI Consultants

December 28, 2007
Project 073290

RCRA RECORDS CENTER
FACILITY MacDermid Inc.
I.D. NO CTD001164599
FILE LOC. R-9
OTHER #107991

Geotechnical
Environmental and
Water Resources
Engineering

Ms. Diane Duva, Assistant Director
Department of Environmental Protection
Waste Engineering and Enforcement Division
Bureau of Materials Management and Enforcement Division
79 Elm Street
Hartford, CT 06106

RE: Scope of Work and Schedule
MacDermid Corporation, Stewardship Permit
Permit # DEP/HWM/CS-151-001
526 Huntingdon Avenue
Waterbury, CT 06702

Dear Ms. Duva:

MacDermid, Inc. has retained GEI Consultants, Inc. (GEI) to assist with compliance and implementation of activities required in Stewardship Permit # DEP/HWM/CS-151-001 signed by the Commissioner on September 28, 2007 (the Permit). Pursuant to Permit Section II.B.2 this letter and attachments provides a Schedule and Scope of Work for proposed activities associated with the investigation and clean-up of releases of hazardous waste and hazardous substances at or from the facility.

It is understood from our recent conversations and e-mails that the Connecticut Department of Environmental Protection (CTDEP) will take the lead on the administrative details of the Permit. The technical lead will be taken by the United States Environmental Protection Agency (EPA). The primary contacts for CTDEP and EPA are Mr. David Rinquist and Ms. Carolyn Casey, respectively.

Schedule

Over the past few weeks, GEI has been assembling volumes of historical site information into a concise summary of current conditions to provide justification and rationale for further environmental investigations at the site. The duration of the Permit considers that continued investigation and remediation of the MacDermid site could take up to 10 years from the date of signing. However, it is MacDermid's intention to complete the terms of the Permit in less than 10 years. It is clear from the long history, complexity and partially developed conceptual model of the site that the approach toward continuing investigations and possible remediation will change as more is learned. Accordingly, the scope and the schedule will be reviewed periodically to consider new data, changes in regulations, or other factors that could alter the objectives and approach toward the ultimate goal of remediation under the Connecticut Remediation Standard Regulations (RSRs).

It is recommended that the schedule and scope of work be reviewed on a quarterly basis concurrent with the EPA Environmental Indicator, Migration of Groundwater under Control. Any changes or significant deviations will be made and reported quarterly, as needed.

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The schedule over the next 6 months, as currently anticipated, is as follows.

- By December 29, 2007; collect groundwater samples to evaluate conformance with the Environmental Indicators (Section II, B (6)). (Wells located and gauged on December 20 and samples collected on December 26.)
- By December 29, 2007; submit a Schedule and Scope of Work per Section II.B.2 of the Permit (this submittal).
- By January 30, 2008; update the site conceptual model and prepare a detailed work plan based on the data gaps identified in this scope of work. This work plan will include the following:
    - A scope of work for an Ecological Risk Assessment ("ERA")
    - A Quality Assurance Project Plan ("QAPP")
    - Details of proposed additional sampling locations, including justification and rationale for the sampling method and the constituents of concern.
    - A detailed schedule for the implementation of the proposed investigative work plan.
    - A preliminary schedule, with critical paths, toward the ultimate remediation of the site.
- By February 15, 2008; meet with EPA to review the justification and rationale for the proposed site assessment activities outlined in the draft work plan.
- By March 1, 2008; implement field work under the work plan.
- By March 30, 2008; collect quarterly groundwater samples to evaluate conformance with Environmental Indicators.
- By May 30, 2008; complete field investigation activities including the ecological risk screening.
- By July 30, 2008; submit a report of findings from the initial scope of work including the following:
    - Modifications to the site conceptual model based upon the new data.
    - Recommendations for additional work and/or interim measures (IM), including an IM work plan.
    - Details of any new release areas discovered beyond those identified in Appendix A-1, Areas of Concern, of the Permit. Note that EPA and CTDEP will be notified within 15 days of the discovery of any release.
    - Revisions to the schedule.

Prior to the issuance of the Stewardship Permit, MacDermid began work and continues to work toward the closure of Resource Conservation and Recovery Act (RCRA) units in accordance with the December 2002 closure plan (with modifications). The closure of the RCRA units is a high priority for MacDermid. Throughout the implementation of the Permit requirements MacDermid will continue to implement RCRA closure activities pursuant to the Closure Plan. Details of activities conducted and schedules for the RCRA closures will be appropriately incorporated into the Permit schedule, scope of work and reporting.

Scope of Work

Permit Section II.B.2 also requires submission of a scope of work that identifies a path toward the ultimate goal of remediation to the Connecticut RSRs. GEI has distilled available information into

a concise summary of each of the AOCs listed in Appendix A-1 of the Permit. Attachment 1 presents a narrative summary of each AOC discussing the physical description, potential release pathways and history of releases investigations and remediation. These summaries are generally qualitative and attempt to consolidate the fundamental understanding of each AOC with the objective of defining what is known about them, and more importantly, what is not known about them. Attachment 2 of this letter presents a site location plan showing the location of each AOC and summary of existing soil and groundwater data throughout the site.

Each AOC description ends with a list of data gaps that is a qualitative summary of what is not known. These identified data gaps will be the objectives of the work plan activities. In the detailed work plan (to be completed by January 31, 2007), specific sampling locations, media sampled, constituents of concern and rationale for each sample will be presented. The detailed work plan will be designed to address each of the data gaps identified in this Scope of Work.

It is understood from our past communications that EPA should be consulted in the final development of the work plan. To this end, MacDermid will provide a draft of the work plan to CTDEP and EPA by the end of January 2007 in anticipation of meeting with them by mid February to discuss the details of the plan and a more detailed schedule to proceed toward the timely remediation of the site on or before the deadlines specified in the Permit.

If you have any questions or would like to discuss the above issues further, my contact information is below. We look forward to working with you and your staff toward the effective closure of the MacDermid facility.

Very truly yours,

GEI Consultants, Inc.

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Attachments
c: Carolyn Casey, USEPA
Dave Ringquist, CTDEP
Larry Miles, MacDermid
John Cordani, MacDermid

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Attachment 1

1. Areas of Environmental Concern

1.1 AOC A, North Parcel

1.1.1 Description of Unit Function, Components and Materials Managed

AOC-A is the area used by MacDermid, Inc. in 1978/1979, reportedly for the disposal of approximately 1,000 cubic yards of metal hydroxide sludge and potentially contaminated soil excavated from MacDermid's waste lagoons (AOC-E1). This disposal area was covered with an asphalt cap in 1986. Prior to 1978/1979, no industrial activities are known to have occurred at AOC-A.

This AOC, measures approximately 50 feet wide by 95 feet long (TRC, 1993), and is located approximately 400 feet north of the Huntingdon Avenue facility on a 30.350 Acre parcel owned by MacDermid.

The material removed from AOC-E1 was reportedly (IPC, 1986) mixed with sand and gravel to increase its load bearing characteristics. Following its placement in AOC-A in 1978/1979, it was covered with clean fill. The existing layer of clean fill (depth varies) was covered with nine (9) inches of processed aggregate and three (3) inches of bituminous concrete (i.e., asphalt) in 1986 (IPC, 1986). The asphalt cap was observed on April 4, 2001 to contain several cracks and was littered with broken glass bottles and plastic cups. The remnants of a small campfire were also observed on the northwestern portion of the asphalt cap.

MacDermid personnel reported to GZA GeoEnvironmental, Inc. of Vernon, Connecticut (GZA, 1995) that the TRC report (TRC, 1993) was incorrect. The metal hydroxide sludge from AOC-E1 was not disposed of in AOC-A, but was disposed of off-site. AOC-A was used to receive potentially contaminated soil from AOC-E1. In the **Part B Permit Application** this area was also annotated as a "soil disposal area" as opposed to caustic sludge disposal. There are several small piles surrounding the asphalt cap that are overgrown with brush.

1.1.2 Potential Release Pathways

- **Surface Water and Sediments** - Minor possibility of erosion from piles and damaged portions of the asphalt cap.
- **Soils** - Exposed piles, Disposal area is capped, but in disrepair. Potential for casual trespassers.

- **Groundwater** - Metals and cyanide have been detected in downgradient wells.
- **Air** - None

1.1.3 History of Releases, Investigations and Remediation

No releases have been documented on AOC-A or the surrounding area. The area, however, was used to dispose of potentially contaminated soil from the former lagoon area. The contents of the surrounding piles are unknown.

Two wells are currently located near AOC-A, MW-101(formerly known as MAC-6) and MW-102. MW-101 (formerly known as MAC-5) is located upgradient on the north edge of AOC-A. MW-102 is located approximately 230 feet south (downgradient) of MW-101, on the south edge of AOC-A.

In April 1986, the industrial Pollution Control (IPC) corporation of Westport, Connecticut, installed the two (2) groundwater monitoring wells in the area of AOC A. Monitoring well MW 101 is a bedrock well. Boring logs indicate that bedrock was encountered at a depth of 3.5 feet below grade. This 2-inch-diameter PVC well was set at a depth on 36 feet below grade (bg) with 10 feet of screen. Monitoring well MW-102, which is located approximately 230 feet south of MW-101, is a 2-inch diameter PVC monitoring well. At this location, refusal was encountered at a depth of 31.75 feet below grade. Monitoring well MW-102 was set at a depth of 31.75 feet bg with 10 feet of screen. The monitoring wells are equipped with two 2-foot high stand piped and locking caps. Groundwater samples taken have indicated concentrations of metal and cyanide in the wells.

1.1.4 Data Gaps

- Condition of the asphalt cap and cover materials needs to be assessed.
- Type of material stored under the cap warrants characterization to confirm if sludge or soil.
- Assess the nature and extent of the surrounding soil piles.
- Assess the volume of the materials stored.
- Assess the effectiveness of the current groundwater monitoring system.
- Evaluate the need for securing the area of AOC-A from potential trespassers.
- Assess the potential for impact to the surface water or sediment of Steele Brook or the Naugatuck River.
- Presence of Total Petroleum Hydrocarbons in the groundwater.

1.2 AOC-B Underground Storage Tank

1.2.1 Description of Unit Function, Components and Materials Managed

This AOC is comprised of one (1) underground storage tank (UST) located on the northern side of the Huntington Avenue building. The additional USTs known to have been located or still in use at this facility, have been identified as AOC-F and AOC-J. The UST located at this AOC was originally installed in 1959 and was replaced in September 1998. This steel tank is cathodically protected and the cathodic protection system is tested on an annual basis to ensure the required negative voltage between the UST and the copper sulfate electrode is being maintained. This UST is used to store No. 2 fuel oil.

1.2.2 Potential Release Pathways

- **Surface Water and Sediments**

None, unless there were a catastrophic release from the tank.

- **Soils**

Leakage from the tank could impact surrounding soils.

- **Groundwater**

Groundwater could be impacted by a release of oil.

- **Air**

No. 2 fuel oil is not a very volatile compound. However a significant subsurface release could release odors to a downgradient building.

1.2.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC. Investigations preformed in the area of AOC-B are summarized in the following reports.

GZA's Soil and Groundwater Investigations (1995); In 1995 GZA installed monitoring well MW-103 (formerly (GZ-2). During installation of the well, a soil sample was collected was taken at a depth of 10-12 feet. The sample was submitted for analysis for TCLP extractable metals and VOC's by EPA method 8260. Results of the sample indicated that no PMC standards were exceeded.

HRP's Groundwater Sampling Event (2001); Groundwater samples were taken from monitoring well MW-103 in March 1995 and February 2001. Samples taken were

analyzed for dissolved metals, total and amenable cyanide, fluoride, and VOCs by EPA method 8260. Sampling results indicate that no standards were exceeded.

Monitoring well MW-103 appears to be located 130 feet hydraulically downgradient of AOC-B. Boring logs for monitoring well MW-103 indicated no visual or olfactory signs of potentially contaminated soil.

1.2.4 Data Gaps

- The condition and operation records of the tank need to be reviewed.
- Condition of the soil surrounding the UST may warrant assessment depending upon the outcome of the operating records assessment.
- Additional groundwater monitoring may be warranted to assess if a release has occurred.

1.3 AOC-C Dry Chemical Silos

1.3.1 Description of Unit Function, Components and Materials Managed

This AOC is located on the northeastern side of the Huntingdon Avenue building and consists of four upright 10,000-gallon steel silos located on a raised concrete pad. These totally enclosed (i.e., top, sides, and bottom) silos were formerly used for the storage of dry sodium carbonate (two types, light and dense, CAS 497-19-8), sodium metasilicate (CAS 6834-92-0), and anhydrous sodium hydroxide (CAS 1310-73-0). The silos are empty; they were environmentally cleaned in May 2002 by LEA/LEA-Cianci, Inc. MacDermid is currently evaluating proposals to have these silos removed.

1.3.2 Potential Release Pathways

- **Surface Water and Sediments**

These silos are empty. Any residual spillage from their past use would have fallen on the pavement in dry form, washed away and degraded.

- **Soils**

The area is paved and any spillage of dry material would have been contained on the surface.

- **Groundwater**

There is minimal potential for residual groundwater impacts from these dry materials.

- **Air**

Because the silos are empty and clean this pathway no longer exists.

1.3.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to have occurred from this AOC. Releases to the environment through dust and spillage may have occurred during the loading and unloading of the silos.

1.3.4 Data Gaps

- Condition of the soil beneath the silos should not be a concern, as the soil is capped by asphalt and concrete.
- Site-wide groundwater monitoring will be assessed for anomalies in pH.

1.4 AOC-D1 Pilot Plant (including QA/QC Labs and small packaging area) and AOC-D2, Main Mixing Area

1.4.1 Description of Unit Function, Components and Materials Managed

These AOCs consist of the Pilot Plant, the QA/QC labs, the small packaging area, a satellite hazardous waste container storage area and the Main Mixing area. They are located in the northeastern end of the Huntingdon Avenue building. These AOCs have been combined due to their proximity in the same building and the similar nature of their past operation and constituents of concern.

No documented releases to the surrounding environment are known to exist for these AOCs.

Within the Pilot Plant, small batches of sample products are produced for MacDermid's customers. The aboveground process tanks located within the Pilot plant range from 5 gallons to 750 gallons in size. The types of chemicals which have been managed within this AOC include: copper etchant, solder stripper, inks, electroless nickel plating solution, dry batch chemicals and components of these materials (TRC, 1993).

To prevent releases to the environment, the Pilot Room is constructed with a concrete floor which is sloped towards a collection sump. Material within the collection sump can either be containerized or discharged to MacDermid's industrial wastewater treatment system (WWTS).

The main mixing area was formerly used to blend copper plating solution. This AGC is currently used to repackage dry chemicals into small units for off-site sale. To prevent releases to the environment, this AOC is equipped with a dust collector, epoxy-coated concrete floor and floor trenches. The floor trenches are connected to MacDermid's WWTS (i.e., AOC-E2). The floor in this area appears eroded from past use.

1.4.2 Potential Release Pathways

- **Surface Water and Sediments**

Any spillage from these operations was contained in the building and discharged to the site WWTP.

- **Soils**

Soils would only be impacted if there were any significant leakage though the concrete floor.

- **Groundwater**

Spillage from these AOCs would have been contained in the building and/or flowed to the site WWTP. Groundwater would only be impacted if there were any significant leakage though the concrete floor.

- **Air**

Chemical processes are removed and this pathway no longer exists.

1.4.2.1 History of Releases, Investigations and Remediation

Spills or releases within the QA/QC lab and the small packaging area would be contained by the area's concrete floor and building walls.

Monitoring wells MW-104 and MW-105 appear to be located downgradient of AOC-D1 and D2. No metal, cyanide, or VOC CT-RSR exceedances were detected in the 1995 soil sample or in the February 2001 groundwater monitoring results.

Boring log for monitoring well MW-105 indicated no visual signs of potentially contaminated soil. The low field PID results listed in MW-105's boring log indicates no significant source of VOC contaminated overburden soils. No boring Log was available for review for monitoring well MW-104.

Investigations preformed in the area of AOC-D2 are summarized in the following reports.

IPC Corporation Groundwater Investigation (estimated 1988); Monitoring well MW-104 was installed by the IPC Corporation. No boring log or well completion report no IPC groundwater monitoring data could be located for the monitoring well.

GZA's Soil and Groundwater Investigations (1995); On February 15, 1995 GZA installed monitoring well MW-105. During installation a soil sample was collected 15-17 feet bg. The sample was submitted for analysis of TCLP extractable metals and VOCs by Method

8260. No CT RSR PMC standard was exceeded from the soil sample. In 1995, groundwater samples were collected by GZA from MW-104 and MW-105 and analyzed for dissolved metals, total and amenable cyanide, fluoride, and VOCs by EPA method 8260.

HRP's Groundwater sampling event (2001); In February 2001, HRP collected groundwater samples from MW 105; the samples were analyzed for dissolved metals, total and amenable cyanide, fluoride, and VOCs by EPA method 8260. No CT-RSR SWPC or I/C VC standards were exceeded in the sample.

Monitoring well MW-104 and MW-105 appear to be located downgradient of AOC-D2.

1.4.3 Data Gaps

- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern.
- Establish if there has been any release through the concrete floor within this building if the concrete has been compromised.
- Extent of contamination to concrete by constituents of concern.

1.5 AOC-E1 Former Waste Lagoons

1.5.1 Description of Unit Function, Components and Materials Managed

AOC-E1 is comprised of two (2) lagoons, which were used from circa 1930 to 1978, as the discharge areas for organic and inorganic process waste. The two lagoons were located on the western side of the Huntingdon Avenue building.

Until 1972 MacDermid discharged its wastewater to on-site catch basins. In 1972 MacDermid installed a WWTS that used two lagoons, one inorganic and one organic. The lagoons settled waste sludge, while the liquid supernatant was discharged to catch basins (CTDEP. 1984a: CTDEP, 1987a). In 1978, an additional WWTS was installed that neutralized the wastewater discharge. The two lagoons were excavated and the sludge removed. Documentation of the sludge disposition was unavailable. From 1978 to 1980 the metal hydroxide sludge from the new WWTS was stockpiled in a new lagoon near the site of the old lagoons. In 1982·1983, this sludge pile was excavated and approximately 168 cubic feet were sent to the Archer Landfill in Shelton, Connecticut (CTDEP. 1987a).

Review of a 1975 aerial photograph obtained from the Connecticut Department of Natural Resources, indicates that one of the former lagoons was located beneath what is currently the Bulk Waste Loading and Storage Area and the Acid Tank Farm. The

approximate dimensions of this lagoon were 190 feet by 60 feet. Review of a 1980 aerial photograph, indicates that the second lagoon was located west of the 1975 lagoon area. The approximate dimensions of the 1980 lagoon were 120 feet by 40 feet. The lagoons are not visible in 1986, 1990, or 1994 aerial photographs.

In 1979 the sludges from both lagoons were reportedly excavated and disposed of off site. The soils underlying the lagoons were excavated and placed in AOC-A. Within these lagoons, the solids settled to the bottom and the liquid was decanted and discharged to the municipal sewer systems.

1.5.2 Potential Release Pathways

- **Surface Water and Sediments**

The former lagoons are covered and are not in direct contact with rainwater.

- **Soils**

Documentation of the lagoon excavations are not available. There is potential for there to be residual soil impacts if waste remains in the lagoons.

- **Groundwater**

Any waste or contaminated soil remaining in the lagoons could impact groundwater.

- **Air**

This pathway is non existent unless the lagoons are excavated.

1.5.3 History of Releases, Investigations and Remediation

In January/February 1995, GZA installed a total of five (5) borings within the estimated footprints of the two (2) former waste lagoons. The locations of these borings were designated B-2, B-3, B-4, MW-108, and MW-109. MW-108 and MW-109 are overburden groundwater monitoring wells.

Based on the results of GZA's 1995 soil/groundwater investigation and HRP's February 2001 groundwater sampling event, it appears that a release may have occurred from AOC-E1. Soil samples from B-2 and MW-108 exhibited metal concentrations (chromium, lead and/or nickel) above CT-RSR's PMC standards.

Well MW-108 continues to exhibit a light non aqueous phase liquids (LNAPL). A floating petroleum product (approximately 6 inches in depth) was observed in monitoring well MW-108 on February 8, 2001. Prior to sampling this well on February 8, 2001, the

floating petroleum product was removed using bailers. This well, which was re-surveyed on February 12 and 14, 2001, was noted to contain approximately 3 inches and Y2 inch of floating petroleum product, respectively. A sample of the petroleum product was submitted to EAS for fingerprinting on February 12, 2001. The petroleum product was determined to contain primarily High Range Organics (HRO). HRO is comprised of organic compounds which contain approximately 20 to 40 carbon atoms. According to EAS, the petroleum product is substantially similar to 30 weight motor oil. Surrounding monitoring wells MW-109 and MW-110 and assumed downgradient monitoring well MW-111 contain no visible petroleum product or petroleum sheen. Monitoring well MW-110; however, did exhibit a green tint.

Groundwater also exhibited concentrations of metals (e.g., copper, nickel, and zinc) and cyanide above the CT-RSR's SWPC standards. Boring logs for borings B-3 and B-4 indicated no visual or olfactory signs of contaminated soil. Boring logs for monitoring well MW-8 indicted the presence of some black staining at the depth of 10 to 12 feet. The spoils from monitoring wells MW-108 and MW-109 were reported to have a "sweet" odor. The field PID readings for boring B-2, and monitoring wells MW-8 and MW-9 were $\leq$0.9 ppm indicates no significant source of VOC contaminated overburden soils at these boring/monitoring well locations.

1.5.4 Data Gaps

- Assess the degree and extent of the LNAPL at MW-108.
- Assess options for the interim remediation of the LNAPL.
- Assess if any residual waste or contaminated soils remain in the buried lagoons.
- Assess the horizontal and vertical extent of the former lagoons.
- Characterize any contaminated soil or waste remaining in the former lagoons.

1.6 AOC-E2 Wastewater Treatment System

1.6.1 Description of Unit Function, Components and Materials Managed

The Wastewater Treatment System (WWTS) was located on the southwestern side of the Huntingdon Avenue building and operated from 1978 to 2002. The WWTS consisted of eight (8) 15,000-gallon lined concrete batch treatment tanks, four (4) 15,000-gallon collection tanks, two (2) 3,000-gallon metal hydroxide (MOH) slurry tanks, a 4,000 gallon recirculation tank, an ultrafiltration unit, a 15-cubic foot filter press, and a 26 cubic yard MOH sludge roll-off container. The 15,000 gallon tanks, designed to allow for segregated chemical treatment, were utilized for batch treatment of wastewaters from the entire facility.

The WWTS was used to treat wash waters and spills generated primarily from copper etchant process area, main mixing area, the pilot plant department, dry mix department, bulk waste loading and storage area and ink manufacturing area. The original WWTS—which did not contain the MOH slurry tanks, filter press, the MOH roll-off and ultrafiltration system—was installed in 1978. The MOH filter press and roll-off was added in 1980; the ultrafiltration system was installed in 1992. The wash waters/spills were treated for the removal of the following pollutants: ammonia, chromium (hexavalent), chromium (total), copper, cyanide (amenable), cyanide (total), fluoride, iron, nickel, tin, zinc, and pH.

After treatment in the batch tanks, wastewater was pumped via a combination of four diaphragm pumps to the microfiltration recirculation tank prior to microfiltration. The sludge from the bottom of each batch tank was pumped via a combination of the same diaphragm pumps to the two sludge holding tanks located in the sludge room. An Integrated Membrane Filtration System was utilized for final polishing of the effluent from the batch treatment tanks prior to discharge to the wastewater holding tanks. The system was designed to filter heavy metals remaining in the wastewater after precipitation and solids settling in each of the batch treatment tanks. After batch treatment and microfiltration polishing, the treated effluent was pumped to one of three 15,000-gallon aboveground fiberglass holding tanks. These holding tanks were used to store treated effluent for testing prior to discharge to the sanitary sewer. Treated effluent was discharged to the city of Waterbury's sewage treatment facility pursuant to National Pollutant Discharge Elimination System (NPDES) Permit # SP0000095. MacDermid was authorized to discharge 60,000 gallons per day under this permit.
Metal hydroxide/sulfide sludge was discharged from the on-site wastewater treatment system to two 3,200 gallon holding tanks. The semi-liquid sludge was then transferred to a filter press, which discharged dewatered sludge directly into 30 cubic yard lined roll off. Once full, the roll-off was shipped off-site to a permitted facility for final treatment and disposal.

The sludge was stored in a 30 cubic yard polyethylene lined roll-off which was housed in a 650-square foot storage building located at the southern side of the Huntingdon Avenue Building and cast of the hulk loading/unloading area. Secondary containment in this area is provided by the interior and exterior concrete walls, a 4-inch berm and a floor trench that discharged directly to the on-site wastewater treatment system. An epoxy coating was applied to fins area; however, the application date is unknown. The majority of the epoxy coating has worn away. The area of the MOH sludge storage in the two 3,000-gallon tanks and the former dried sludge roll off container are considered RCRA storage areas subject to closure requirements.

The WWTS tanks were constructed of steel, concrete, or fiber-reinforced plastic (FRP). The tanks were located on a concrete floor and are surrounded by a concrete berm. The batch treatment tanks were also connected to a wet scrubber system, which removed ammonia vapors. No documented releases to the surrounding environment are known to exist for this AOC.

Spent etchant recycling activities at the Huntingdon Avenue facility were last performed in December 2001. Chemical production and laboratory activities performed at the Huntingdon Avenue facility ceased in April 2002. Wastewater treatment activities were discontinued in May 2002.

1.6.2 Potential Release Pathways

- **Surface Water and Sediments**

All WWTS operations are stopped and chemicals removed. During operation any releases would have been directed to the WWTS and discharged via the NPDES permit.

- **Soils**

Most of these operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.6.3 History of Releases, Investigations and Remediation

As discussed in AOC-E1, groundwater in this area has been impacted. Groundwater exhibited metal concentrations (e.g., copper nickel, and zinc) and cyanide above the CT-RSR's SWPC standards.

In January 2003, LEA submitted a Closure Plan for the Waste Water Treatment System to the CT-DEP. This plan was accepted by the CT-DEP in a letter dated February 11, 2003. Upon report of completion of closure activities, Permit #SP0000095 was terminated.

During September 2007 the building housing the sludge storage and roll-off container, (Area E in the Closure Plan) was demolished by EQ. MacDermid and EQ are in the process of characterizing approximately 60 tons of impacted soil removed from below this building.

1.6.4 Data Gaps

- Assess the status of closure of the RCRA regulated portion of this AOC and implement RCRA closure activities as needed.
- Assess the potential for this area to be a source of the surrounding groundwater impacts.
- Assess residual impacts to the concrete floor.

1.7 AOC-E3 Bulk Spent Copper Etchant Unloading Storage Area

1.7.1 Description of Unit Function, Components and Materials Managed

The Bulk Spent Copper Etchant Unloading and Storage Area, was located at the northwestern end of the Huntingdon Avenue building, is used to manage spent copper etchant. This AOC was considered an RCRA storage while in operation.

The enclosed 45 foot by 65 foot Bulk Spent Copper Etchant loading Area is equipped with a concrete floor, which is sloped towards floor trenches. The floor trenches are connected to the WWTS (i.e. AOC-E2). The Bulk Storage Area for spent copper etchant is located immediately east of the Bulk Spent Copper Etchant Loading Area. Located within the Bulk Storage Area were three (3) 7,500-gallon aboveground FRP storage tanks and one (1) 3,500-gallon aboveground FRP storage tank. The 7,500-gallon storage tanks were used to store spent copper etchant received from MacDermid's customers. The 3,500 gallon tank was used to store the process chemical sodium hydroxide; it would be used to store spent copper etchant only if additional bulk storage capacity was needed (i.e., 22,500-gallon capacity is exceeded).

The Bulk Storage Area, which measures approximately 55 feet by 17.5 feet was equipped with an epoxy coated concrete floor, 2 feet 7 inches high epoxy coated block-wall (south side), epoxy coated building walls (north, east, and west sides), and two (2) collection sumps. Any material collected within the collection sump (located in the northeastern corner of the storage area) was pumped to the main collection sump (located in the middle of the storage area). From the main collection sump, the collected material was pumped to the WWTS (i.e., AOC-E2). The primary hazardous constituents associated with the spent copper etchant are: ammonia, arsenic, chloride, copper, chromium, lead, nickel, tin, and zinc. The start-up date for this AOC is estimated to be 1970.

One exterior wall, two interior walls and a 31 -inch high block wall provide secondary containment for this approximately 1,050 square foot area. The concrete floor and block wall is epoxy coated to a height of 31 inches. The original application date of the epoxy is unknown; however, Stonclad HT was applied to the area in 1998. The epoxy coating is currently in good condition. One polypropylene-lined concrete floor sump is located in the northwestern corner of this area. This sump feeds to the main collection sump by a level controlled pump and PVC piping. The main collection sump is located centrally in the unit and pumps to the drum washing sump (outside of the regulated unit) which discharges directly into the wastewater treatment system.

1.7.2 Potential Release Pathways

- **Surface Water and Sediments**

All etchant operations are stopped and chemicals removed. During operation releases would have been directed to the WWTS and discharged via the NPDES permit. Any releases outside the loading area would have discharged to the site storm drainage.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.7.3 History of Releases, Investigations and Remediation

A CTDEP inspector noticed on February 10, 1990, that water from a drum washing operation outside the loading area was being allowed to flow into the on-site catch basins. The discharge point for the catch basins is Steele Brook (TRC, 1993). The sediment located directly beneath the catch basins outfall (Steele Brook) was excavated in November 1994 in response to a spent copper etchant spill (see AOC-E6 description). As discussed in AOC-E1, groundwater in this area is impacted. Groundwater exhibited metal concentrations (e.g., copper nickel, and zinc) and cyanide above the CT-RSR's SWPC standards.

On September 18 and 21, 2001, an inspection was conducted by the DEP Bureau of Waste Management in which violations of the RCRA Part B permit. Specifically related to this AOC was the finding that MacDermid failed to maintain adequate secondary containment for the three spent copper etchant tanks. Specifically, a hole was present in the wall between the spent copper etchant tanks and a nearby brine tank. The floor of the brine tank area was not provided with an impermeable interior coating. Plus, an open seam was noted along the floor at the back of the containment system for the three spent copper etchant tanks.

The building housing the filter bulk spent copper etchant unloading and storage area was constructed directly atop the site of the former 1978 sludge settling lagoon.

In conjunction with the September 2007 demolition of the building housing the sludge storage and roll-off container noted earlier, the floor and several cubic yards of underlying material inside the bulk storage area (Area C in the Closure Plan) were removed by (EQ), with Professional Engineering oversight provided by Mark Franzen, P.E. Impacted soils have been removed to depth. A closure summary report is pending.

1.7.4 Data Gaps

- Assess the status of closure of the RCRA regulated portion of this AOC and implement RCRA closure activities as needed.
- Assess the potential for this area to be a source of the surrounding groundwater impacts.

1.8 AOC-E4 Spent Copper Etchant Recycling Area

1.8.1 Description of Unit Function, Components and Materials Managed

This AOC, was constructed circa 1970 and is located in the western portion of the Huntingdon Avenue building, houses the spent copper etchant processing area. A portion of this area was considered a RCRA storage unit during operation. This recycling operation formerly contained two (2) aboveground stainless steel reactors, six (6) aboveground ammonia scrub tanks, three (3) aboveground product storage tanks, and various aboveground process chemical tanks. All the tanks from the RCRA regulated area have been removed. A few of the unused process tanks remain in the non-RCRA areas. All tanks within this area were located on an epoxy-coated concrete floor, which is sloped to a floor trench system. The floor trench system is connected to the WWTS (Le. AOC-E2). The primary hazardous constituents managed within this processing area are: ammonia, arsenic, chloride, copper, chromium, lead, nickel, tin, and zinc.

1.8.2 Potential Release Pathways

- **Surface Water and Sediments**

All etchant operations are stopped and chemicals removed. During operation releases would have been directed to the WWTS and discharged via the NPDES permit. Any releases outside the loading area would have discharged to the site storm drainage.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.8.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC. Spills or releases within AOC-E4 would be directed to the WWTS (i.e., AOC-E2) by means of sloped concrete floors and a floor trench system. The IPC Corporation (IPC) installed monitoring wells MW-106 and MW-107 within the area of the copper etchant processing area (date is not known). Based on GZA's 1995 groundwater sampling results, the groundwater in this area has been impacted by metals and cyanide.

1.8.4 Data Gaps

- Assess the tank contents and characterize any residuals that may remain.
- Assess the status of closure of the RCRA regulated portion of this AOC and implement RCRA closure activities as needed.
- Assess the potential for this area to be a source of the surrounding groundwater impacts.
- Assess residual impacts to the concrete floor in the RCRA area and assess for cracks or impacted concrete in the non RCRA areas.

1.9 AOC-E5 Acid Tank Farm

1.9.1 Description of Unit Function, Components and Materials Managed

This area was used to store bulk quantities of the raw process chemicals: hydrochloric acid, nitric acid, hydrogen peroxide, and sulfuric acid. A maximum of 30,000 gallons of process chemicals were managed within this area at anyone time. The storage tanks are located outside the building on an epoxy-coated concrete base and surrounded by a 2-foot-high epoxy-coated concrete berm. Within this storage area are two collection sumps, which are connected to the WWTS (i.e., AOC-E2). The start-up date of this AOC is not known.

1.9.2 Potential Release Pathways

- **Surface Water and Sediments**

Operations are stopped and chemicals removed. During operation releases would have been directed to the WWTS and discharged via the NPDES permit. Any releases outside the loading area would have discharged to the site storm drainage.

- **Soils**

These operations had secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.9.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC. Spills or releases within AOC-E5 would be directed to the WWTS (i.e., AOC-E5) by means of the asphalt base, concrete berm, and two (2) collection sumps. To minimize the possibility of any releases from AOC-E5 and other AOCs in the area to the stormwater collection system, MacDermid retrofitted catch basins CB-1, CB-2, and CB-3 with watertight manhole covers in 1998. As discussed in AOC-E1, groundwater in this area has been impacted. Groundwater exhibited metal concentrations (e.g., copper nickel, and zinc) and cyanide above the CT-RSR's SWPC standards.

1.9.4 Data Gaps

- Assess the potential for this area to be a source of the surrounding groundwater impacts.
- Assess the integrity of the concrete floor.

1.10 AOC-E6 and 1994 Spent Copper Etchant Spill

1.10.1 Description of Unit Function, Components and Materials Managed

In November 1994, approximately 1,500-gallons of spent copper etchant were accidentally released to the Steele Brook through the stormwater collection system. It is believed that this release was caused by the vacuum generated from the piping system of a non-contact cooling water discharge.

A mixture of non-contact cooling water and spent copper etchant was discharged to catch basin CB-2 or CB-3. The discharge of non-contact cooling water was authorized by a CT-DEP permit. The discharge of non-contact cooling water was eliminated by MacDermid in the spring of 1997. Upon discovery of this release, MacDermid removed the copper etchant from the 4,000-gallon storage tank and immediately contacted the CT-DEP.

1.10.2 Potential Release Pathways

- **Surface Water and Sediments**

During operation the releases discharged to the site storm drainage and Steele Brook.

- **Soils**

The spill was contained to the storm sewer system and the receiving stream.

- **Groundwater**

The spill was contained to the storm sewer system and the receiving stream.

- **Air**

This pathway is negligible.

1.10.3 History of Releases, Investigations and Remediation

The CT-DEP supervised the initial removal activities which included removing more than 30,000 gallons of water and copper etchant from Steele Brook.

Following the removal activity, MacDermid hired HRP to sample the sediment within Steele Brook. The results of HRP's sampling activity were submitted to the CT-DEP on December 24, 1994 in a report titled *STEELE BROOK / NAUGA TUCK RIVER SEDIMENT SAMPLING RESULTS*.

A total of fifteen (15) sediment samples were collected and analyzed for copper, lead, nickel, and zinc by mass analysis. The metal concentrations, in general, decreased as the downgradient sampling distance from the outfall of the stormwater drainage system increased. The two (2) sediment samples collected upgradient of stormwater drainage system's outfall (2 and 6) also exhibited relatively concentrations of the metals copper, lead, nickel, and zinc. The Steele Brook and the stormwater drainage system, which received MacDermid's 1994 spent copper etchant spill, have been used for years as the discharge location by other manufacturing facilities for industrial wastewaters. Although the CT-RSR currently contains no standards for sediment, all the 1994 sediment samples exhibited concentrations below the CT-RSR's Residential DEC standards.

1.10.4 Data Gaps

- None, this issue has been closed.

1.11 AOC-F Former 6,000 Gallon UST (East Aurora Street Building)

1.11.1 Description of Unit Function, Components and Materials Managed

This AOC was comprised of one (1) 6,000 gallon UST located on the eastern side of the East Aurora Street building. This former #2 fuel oil storage tank was installed in 1978 and removed from service in September 1998. Due to the location of this AOC (partially beneath the East Aurora Street building), it was abandoned in-place. The remaining fuel oil was removed from the tank and the tank was cleaned and filled with petrofill foam.

1.11.2 Potential Release Pathways

- **Surface Water and Sediments**

There is negligible risk to this pathway since the tank has been closed.

- **Soils**

Soil could have been impacted only if there was a leak from the tank.

- **Groundwater**

Groundwater could have been impacted only if there was a leak from the tank.

- Air

This pathway is negligible.

1.11.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC. Releases from the UST in this AOC may have occurred if the structural integrity of the UST had been impacted prior to abandonment in-place or during filling operations. Monitoring well MW-105 appears to be located immediately downgradient of AOC-F. No petroleum hydrocarbon sheen or organic compounds typically contained in petroleum products were observed in MW-105 during the February 2001 sampling event.

Boring logs for monitoring well MW-105 indicated no visual signs of potentially contaminated soil. The field PID readings for MW-105 were $\leq$0.9 ppm (relative to benzene in air), which indicate no significant source of VOC contaminated overburden soils at this location.

1.11.4 Data Gaps

- Groundwater downgradient from this area will be assessed with the site-wide groundwater conditions.

1.12 AOC-G East Aurora Street Warehouse

1.12.1 Description of Unit Function, Components and Materials Managed

The East Aurora Street warehouse, which is located in the center of the site, was constructed in circa 1985. This AOC consists of the main hazardous waste storage area ("Main Container Storage Area"), the quality control area, the finished product storage area and the shipping/receiving area. Two portions of this AOC are former RCRA regulated storage units subject to closure.

The main hazardous waste storage area was used by MacDermid for the storage of copper etchant solution in containers, process chemicals (excluding solvents) in containers, finished products in containers, wooden pallets, empty containers, and miscellaneous items such as scrap steel, office equipment, etc. The area was proposed in the original 1999 "*Hazardous Waste Part B Permit Application Renewal*" to have a maximum of 46,640 gallons of spent copper etchant (728 55-gallon drums and/or 20 220/330-gallon totes). This rectangular-shaped storage area measures 93' long by 42' wide. Secondary containment was provided by an epoxy-coated concrete floor, building walls, 38" high concrete berms and a collection sump. The material collected within the sump was pumped to MacDermid's WWTS (i.e., AOC-E2).

The quality control area ("Quality Control [QC] [waste staging area]") is located immediately east of the main hazardous waste storage area and was used for performing spot tests on containers of spent copper etchant. The area was proposed in the original 1999 "*Hazardous Waste Part B Permit Application Renewal*" to have a maximum of 6,380 gallons of spent copper etchant. Secondary containment within this triangular-shaped storage area is provided by an epoxy-coated concrete floor, building walls and 3 1/2" to 6" high concrete berms.

Secondary containment within the finished product storage area and the shipping/ receiving area is provided by an epoxy-coated floor and building walls. No floor drains are known to be located in these areas. The areas immediately outside this AOC are covered with asphalt.

1.12.2 Potential Release Pathways

- **Surface Water and Sediments**

All waste storage and QA/QC operations are stopped and chemicals removed. During operation releases would have been contained in the building. Any releases outside the loading area would have discharged to the site storm drainage.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.12.3 History of Releases, Investigations and Remediation

In March 1995, February 2001, July 2006, October 2006, February 2007 and May 2007 Groundwater samples were collected from MW-111. Results from the 2001 samples indicated a level of zinc that exceeded CT RSR SWPC standards.

Sampling of the concrete floors has been conducted in both RCRA storage areas. This sampling shows some relatively minor impacts that may warrant decontamination. However, there is no current indication of a significant release to soil or groundwater from this area.

1.12.4 Data Gaps

- The current RCRA closure plans for the two storage areas will be reviewed and plans made for their implementation.
- Extent of contamination of concrete by constituents of concern. Some concrete chip sampling was conducted by LEA, but the sample results have not been thoroughly evaluated.
- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern.
- Continued evaluation of the site-wide groundwater system will better assess if there has been a release to groundwater.

1.13 AOC-H Flammable Material Rack Storage Area

1.13.1 Description of Unit Function, Components and Materials Managed

The Flammable Material Rack Storage Area was located on the northwestern side of the site, approximately 200 feet north of the Gear Street Building. This outdoor storage area, which was 40 feet long by 25 feet wide, was used to store containers of raw flammable chemicals such as alcohols, solvents, etc. The building has been demolished and only a concrete slab remains.

Within this storage area the raw material containers were stored on a four-tier high drum rack system. Secondary containment was provided by a concrete floor and a three (3) inch high concrete berm. No documented releases to the surrounding environment are now to exist for this AOC. In the event of a spill or release outside this AOC's secondary containment area, the releases would flow towards the on-site catch basins. All raw material transfer operations at MacDermid, Inc. were performed by experienced forklift operators. Spill control equipment was maintained inside AOC-H.

1.13.2 Potential Release Pathways

- **Surface Water and Sediments**

All flammable storage operations are stopped, chemicals removed and the building demolished. During operation releases would have been contained in the building. Any

releases outside the loading area would have discharged to the site storm drainage. The building was equipped with spill control equipment.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater would be impacted from this AOC only if there had been a release to soil.

- **Air**

This pathway is negligible with the operation closed.

1.13.3 History of Releases, Investigations and Remediation

On January 13, 1995, GZA installed groundwater monitoring well MW-112 immediately north of the Gear Street Building. During the installation of MW-112, GZA collected and analyzed the soil sample collected from the 0.5-2.5 foot horizon. Only the PMC standard for lead was exceeded. The boring log for monitoring well MW-112 indicated the presence of cinders/ash (fill) at the depth of 0.5 to 2.5 feet. The field PID readings for the soils screened during the installation of MW-112 were below laboratory detection limit (i.e., indicating that no VOC contaminated overburden soils were detected at this location).

In March 1995, February 2001, July 2006, October 2006, February 2007 and May 2007 groundwater samples were collected from MW-112 and analyzed for dissolved metals, total and amenable cyanide, fluoride and VOCs by EPA Method 8260. Only the SWPC for zinc was slightly exceeded in February 2001. This lead contamination may have been caused by the Waterbury Steel Ball Company who occupied the Gear Street Building from prior to 1922 to circa 1977.

1.13.4 Data Gaps

- It is unknown if there were any releases to soil under or around the former building.
- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern.

- Continued evaluation of the site-wide groundwater system will better assess if there has been a release to groundwater.

1.14 AOC-I Ink Spill Area

1.14.1 Description of Unit Function, Components and Materials Managed

In 1987, IPC personnel discovered stained soil underneath a concrete pad located north of the Gear Street Building and near a former ink spill sump. The spill material appeared to be an epoxy-like ink product which was manufactured at MacDermid, Inc. The material safety data sheet for the MacDermid ink product MACUMASK 9415 (suspected spill material) was reported to be comprised of; pigments (organic, non-metallic) catalyst (aromatic ketones), vehicle (acrylic monometers) and additives (inert filler such as MgO,) The release was reported to the CTDEP and cleaned-up in accordance with CT-DEP's "Contaminated Soils Removal and Disposal Guidelines". Approximately 550 cubic feet of soil was reportedly removed from this release area and disposed off site

1.14.2 Potential Release Pathways

- **Surface Water and Sediments**

All ink handling and storage operations are stopped and chemicals removed. During operation releases would have been contained in the building. Any releases outside the building could have discharged to the site storm drainage.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised. The historical spill soil impacts will be reviewed relative to current standards.

- **Groundwater**

Groundwater may have impacted from this AOC from the historical spill.

- **Air**

This pathway is negligible with the operation closed.

1.14.3 History of Releases, Investigations and Remediation

This release was reported to have occurred from the former ink spill sump. The date this release occurred is not known. The remedial measures performed at this AOC in 1987/1988 are reported to be the follows:

- Following removal of the concrete pad collected two (2) composite soil samples from the western face of the excavation at the following locations:
  - 30 inches below grade, visually clean soil.
  - 18 inches below grade, ink/soil layer.
- Based on soil sampling results excavated to a depth of 30-36 inches. The area of excavation was 11.5 feet by 16 feet.
- Following excavation collected a composite soil sample from the bottom of the excavation in November/December 1987.
- Collected soil samples from the eastern and western face (i.e., sidewalls) of the excavation in March 1988.
- Based on the November/December 1987 and March 1988 soil sampling results requested CT-DEP approval to backfill the excavation.

The excavation area was backfilled and is now covered with asphalt (i.e., part of the parking lot). No written approval to backfill this excavation is known to have been received from the CT-DEP.

On January 15, 1995, GZA installed groundwater monitoring well MW-113 immediately south of the Gear Street building. This monitoring well, which appears to be located hydraulically downgradient of AOC-I, was sampled by *GZA* in March 1995 and HRP in February 2001. Based on the groundwater monitoring results only the CT-RSR's SWPC for zinc was slightly exceeded in February 2001. No solvents, which were detected in 1987/1988 soil sampling activity, have been detected in the groundwater.

1.14.4 Data Gaps

- The residual from the historical spill and remediation needs to be compared to current soil and groundwater RSRs.
- Continued evaluation of the site-wide groundwater system will better assess if there has been a release to groundwater.

1.15 AOC-J 4,000 Gallon UST (Gear Street Building)

1.15.1 Description of Unit Function, Components and Materials Managed

This AOC is comprised of one (1) 4,000 gallon No. 2 fuel oil underground storage tank (UST) located on the northeastern side of the Gear Street building. This UST, which was installed in November 1988, replaced a 10,000-gallon UST that was installed in 1963. The former 10,000-gallon UST was also used to store No. 2 fuel oil.

1.15.2 Potential Release Pathways

- **Surface Water and Sediments**

There is negligible risk to this pathway since these tanks have been closed.

- **Soils**

Soil could have been impacted only if there was a leak from the tanks.

- **Groundwater**

Groundwater could have been impacted only if there was a leak from the tank.

- **Air**

This pathway is negligible.

1.15.3 History of Releases, Investigations and Remediation

On January 15, 1995 GZA installed monitoring well MW-113. This monitoring well, which appears to be located hydraulically downgradient of AOC-J, was sampled by GZA in March 1995 and by HRP in February 2001. Only the CT-RSR SWPC standard for zinc was exceeded in this shallow overburden monitoring well in February 2001.

In November 2002 Loureiro Engineering Associates (LEA) performed the oversight, sampling and reporting activities and LEA-Cianci, Inc., physically removed the tank, effectively closing out this AOC. The sampling of the UST closure consisted of collecting six soil samples as follows: one from each of the four sidewalls, at the level of the tank bottom, one in the pipe trench and one from the bottom of the tank excavation. All samples were submitted for extractable total petroleum hydrocarbon (ETPH) analysis. All were found to have less than 23 mg/kg ETPH dry weight.

1.15.4 Data Gaps

- None, this area has been closed consistent with RSRs.

1.16 AOC-K1 Former Flammable Storage Area

1.16.1 Description of Unit Function, Components and Materials Managed

The Former Flammable Storage Area, which was located in the northeastern side of the Gear Street Building was used to store containers of flammable hazardous waste until 1999. Within this former 8 foot by 10 foot storage area, a maximum of sixteen (16) 55-gallon drums of hazardous waste would be managed at any one time. The types of waste managed within this area included flammable waste solvents (e.g., toluene, methyl, ethyl ketone, xylene, etc.). Secondary containment was provided by an epoxy-coated concrete floor and 4" x 4" epoxy-coated angle iron berms.

1.16.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.16.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC.

To determine if the former hazardous waste storage operation had impacted the environment, closure activities were initiated in December 1999. The closure activities, which are summarized in the report entitled, "RCRA Closure Summary for Former Hazardous Waste Storage and Recycling Areas" included the following:

- Analysis of the concrete floor of the former storage area for the hazardous constituents listed under 40 CFR 264 Appendix IX. The results of this analysis were used to finalize the list of constituents of concern (COCs) managed in this former storage area.
- Analysis of concrete floor (discrete samples) of the former storage area for all identified COCs by mass analysis and all metallic COCs by the E.P. Toxicity testing procedure.
- Comparison of the concrete sampling results to the CT-DEP approved closure standards.

Based on the concrete chip sampling results), it was HRP's opinion that this AOC has not impacted the environment (i.e., clean closure). The site was certified by HRP as closed in 2002.

1.16.4 Data Gaps

- None, this area has been closed per an approved RCRA closure plan and certified by a PE.

1.17 AOC K2 Former NMP Recycling Area

1.17.1 Description of Unit Function, Components and Materials Managed

The Former NMP Recycling Area was located in the same room as the Former Flammable Storage Area. This former recycling operation contained a 500-gallon above-ground reactor tank and a 55-gallon stainless steel product tank. Secondary containment was provided by the concrete floor, building walls, and spill collection floor trench. Any material collected within the floor trench would have been discharged to MacDermid's on-site industrial WWTS (i.e., AOC-E2).

1.17.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.17.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC.

To determine if the former hazardous waste recycling operation had impacted the environment, closure activities were initiated in December 1999. The closure activities which are summarized in the report titled, "RCRA Closure Summary for Former Hazardous Waste Storage and Recycling Areas" included the following:

- Analysis of concrete floor of the former recycling area for the hazardous constituents listed under **40 CFR 264 Appendix IX**. The results of this analysis were used to finalize the list of constituents of concern (COCs) managed in this former recycling area.
- Analysis of the second concrete slab for all identified COCs by mass analysis and all metallic COCs by the E.P. Toxicity testing procedure. Discrete concrete samples were collected from beneath the cracks and gaps identified in the concrete floor surface of the recycling area.
- Analysis of subsurface soil directly beneath the second concrete slab sampled areas for all identified COCs by mass analysis and all metallic COCS by the E.P. Toxicity testing procedure.
- Analysis of concrete floor surface (discrete samples) of the former recycling area for all identified COCs by mass analysis and all metallic COCs by the E.P. Toxicity testing procedure.
- Comparison of the concrete and soil sampling results to the CT-DEP approved closure standards.

Based on the sampling results, approximately 5 cubic yards of concrete required removal and disposal to meet CT-DEP's approved closure standards. The site was certified as closed by HRP.

1.17.4 Data Gaps

- The site closure information will be compared to current RSRs to confirm conformance.

1.18 AOC-K3 Former Solder Stripper Recycling Area

1.18.1 Description of Unit Function, Components and Materials Managed

The former Solder Stripper Recycling Area was located in the northern end of the Gear Street Building and contained three (3) aboveground process tanks. The total capacity of these tanks was 5,000 gallons. This batch recycling operation was used to process 1,300 gallons of solder stripper at a time. Secondary containment was provided by an epoxy-coated concrete floor, building walls, and spill collection floor trench. The floor trench, which has been removed from service, would direct any collected material to MacDermid's on-site industrial WWTS (i.e., AOC-E2).

1.18.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.18.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for this AOC. To determine if the former hazardous waste recycling operation had impacted the environment, closure activities were initiated in December 1999. The closure activities which are summarized in the report entitled, "RCRA Closure Summary for Former Hazardous Waste Storage and Recycling Areas" included the following:

- Analysis of concrete floor of the former storage area for the hazardous constituents listed under 40 CFR 264 Appendix IX. The results of this analysis were used to finalize the list of constituents of concern (COCs) managed in this former storage area.
- Analysis of subsurface soil (beneath concrete floor cracks and gaps) for all identified COCs by mass analysis and metallic COCs by the .E.P. Toxicity testing procedure.
- Analysis of concrete floor surface (discrete samples) of the former recycling area for all identified COCs by mass analysis and all metallic COC by the E.P. Toxicity testing procedure.
- Comparison of the soil and concrete sampling results to the CT-DEP approved closure standards.

Based on the soil and the concrete chip sampling results approximately 1.5 cubic yards of contaminated soil and 1.5 cubic yards of contaminated concrete require removal and disposal to meet CT·DEP's approved clean closure standards. The area was certified closed by HRP.

1.18.4 Data Gaps

- None, this area has been closed per an approved RCRA closure plan and certified by a PE.

1.19 AOC K4 Gear Street Industrial Wastewater Sump Release

1.19.1 Description of Unit Function, Components and Materials Managed

This area is adjacent to AOC K-3 and AOC- I (1987 ink spill area). It consisted of a single spill in 2000 of untreated wastewater. The untreated wastewater was collected in a sump prior to discharge to the site WWTS. The sump overflowed.

1.19.2 Potential Release Pathways

- **Surface Water and Sediments**

All operations are stopped and chemicals removed. The 2000 spill may have migrated to the storm sewer system.

- **Soils**

The historical spill soil impacts will be reviewed relative to current standards.

- **Groundwater**

Groundwater may have impacted from this AOC from the historical spill.

- **Air**

This pathway is negligible with the operation closed.

1.19.3 History of Releases, Investigations and Remediation

On December 5, 2000, a release from the industrial wastewater sump located in the northern end of the former Solder Stripper Recycling Area was discovered by MacDermid, Inc. personnel. This release was reported to the CTDEP on December 6, 2000. The volume of process industrial wastewater released from this sump is unknown. To prevent any further releases from this sump, MacDermid performed the following:

- Re-directed industrial wastewater discharge to another wastewater collection sump.
- Drained the leaking collection sump of any wastewater.
- Filled-in the leaking collection sump with concrete.

1.19.4 Data Gaps

- The residual from the historical spill and remediation needs to be compared to current soil and groundwater RSRs.
- Continued evaluation of the site-wide groundwater system will better assess if there has been any residual impact to groundwater.

1.20 AOC K5 Ink Manufacturing Area

1.20.1 Description of Unit Function, Components and Materials Managed

This AOC is located in the southeastern side of the Gear Street Building. This area, which was comprised of tanks and roller mills, was used to prepare inks for the printed circuit board industry. The types of chemicals used in this area include: pigments, solvents, acrylimides, anjnes, and resins. No documented releases to the surrounding environment are known to exist for this AOC. To prevent releases from entering the environment, this AOC is equipped with the following secondary containment provisions; epoxy-coated concrete floor, building walls, and wastewater collection sump. The material collected in the collection sump would be discharged to MacDermid's industrial WWTS (Le., AOC-E2).

1.20.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.20.3 History of Releases, Investigations and Remediation

There are no known releases to this area. All operations have been stopped and chemicals removed. There is no existing down gradient groundwater monitoring wells from this AOC.

1.20.4 Data Gaps

- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern need to be assessed.
- Continued evaluation of the site-wide groundwater system will better assess if there has been any residual impact to groundwater.

1.21 AOC-K6 Electroless Nickel Area

1.21.1 Description of Unit Function, Components and Materials Managed

This AOC is located along the western side of the Gear Street Building. This area, which contained eight (8) process tanks with a capacity of up to 1,200 gallons (TRC, 1993), was used to manufacture electroless nickel plating solutions. The operations are closed and chemicals removed.

1.21.2 Potential Release Pathways

- **Surface Water and Sediments**

All manufacturing and storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.21.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for AOC-K6. To prevent releases from entering the environment, this AOC is equipped with the following secondary containment provisions: epoxy-coated concrete floor, building

walls, and wastewater collection sump. The material collected in the collection sump would be discharged to MacDermid's industrial WWTS (i.e., AOC-E2).

1.21.4 Data Gaps

- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern.
- Continued evaluation of the site-wide groundwater system will better assess if there has been any residual impact to groundwater.

1.22 AOC K7 Satellite Storage Areas

1.22.1 Description of Unit Function, Components and Materials Managed

Located with AOC-1 are three (3) hazardous waste satellite storage areas. The satellite storage areas are located in the former **Solder Stripper Recycling Area**, in the **Ink Manufacturing Area** and **immediately west** of the Ink Manufacturing Area. Located within each satellite storage area were a maximum of two (2) 55-gallon drums, which are used to temporarily store the hazardous waste generated in the area. When each drum was full, it was transferred to MacDermid's $\leq$ 90 day container storage area (i.e., AOC-K8). In the 1999 "*Hazardous Waste Part B Permit Application Renewal*" a total of five satellite accumulation areas were described.

1.22.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

- **Soils**

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.22.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for AOC-K7. To prevent releases from entering the environment, this AOC is equipped with the following secondary containment provisions: epoxy-coated concrete floor, building walls, and wastewater collection sump. The material collected in the collection sump would be discharged to MacDermid's industrial WWTS (i.e., AOC-E2).

1.22.4 Data Gaps

- Presence of any cracks in the concrete with penetrations to the subsoil which would allow contamination by constituents of concern.
- Continued evaluation of the site-wide groundwater system will better assess if there has been any residual impact to groundwater.

1.23 AOC K8 Chemical Storage Area

1.23.1 Description of Unit Function, Components and Materials Managed

This AOC, which is located in the southern end of the Gear Street Building and consists of the less than 90 day hazardous waste storage area and the Chemical Storage Area. The Chemical Storage Area is the former Combustible Storage Area. The Combustible Closure Area was RCRA regulated and closed circa 1999. The less than 90 day hazardous waste storage area measure approximately 40 feet long by 20 feet wide. Secondary containment for this hazardous waste storage area is provided by an epoxy-coated concrete floor and 4" high epoxy-coated angle-iron. The Chemical Storage Area (former Combustible Storage Area) was designed to store up to fifty-four (54) 55-gallon drums and four (4) 330-gallon storage totes. Secondary containment for this storage area was provided by an epoxy-coated concrete floor and 4" high epoxy-coated angle-iron.

1.23.2 Potential Release Pathways

- **Surface Water and Sediments**

All storage operations are stopped and chemicals removed. During operation releases would have been contained in the building.

Soils

These operations were indoors with secondary containment with little potential for direct soil contact. Seepage through the concrete floors is possible if the floor were compromised.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the floor.

- **Air**

This pathway is negligible with the operation closed.

1.23.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for AOC-K8. To prevent releases from entering the environment, this AOC is equipped with the following secondary containment provisions: epoxy-coated concrete floor, building walls, and wastewater collection sump. The material collected in the collection sump would be discharged to MacDermid's industrial WWTS (i.e., AOC-E2). The former Combustible storage area was closed circa 1999; however, detailed information of this closure was not available.

1.23.4 Data Gaps

- The documentation for the closure of the former combustible storage area under RCRA is not clear. The past closure means and methods need to be compared against current guidance.

1.24 AOC L Transformer Vault

1.24.1 Description of Unit Function, Components and Materials Managed

This AOC is located on the south side of the Gear Street Building. This 4'x4'x4' steel transformer vault is located on a concrete pad.

1.24.2 Potential Release Pathways

- **Surface Water and Sediments**

Surface water and sediments would be impacted only if there was leakage from the transformer to a storm drain. This is remote given there are no storm drains in the immediate area.

- **Soils**

Seepage through the concrete or asphalt from leakage could impact underlying soils.

- **Groundwater**

Groundwater may have impacted from this AOC only if there were a release through the pavement.

- **Air**

This pathway is negligible unless there was a fire that consumed the transformer.

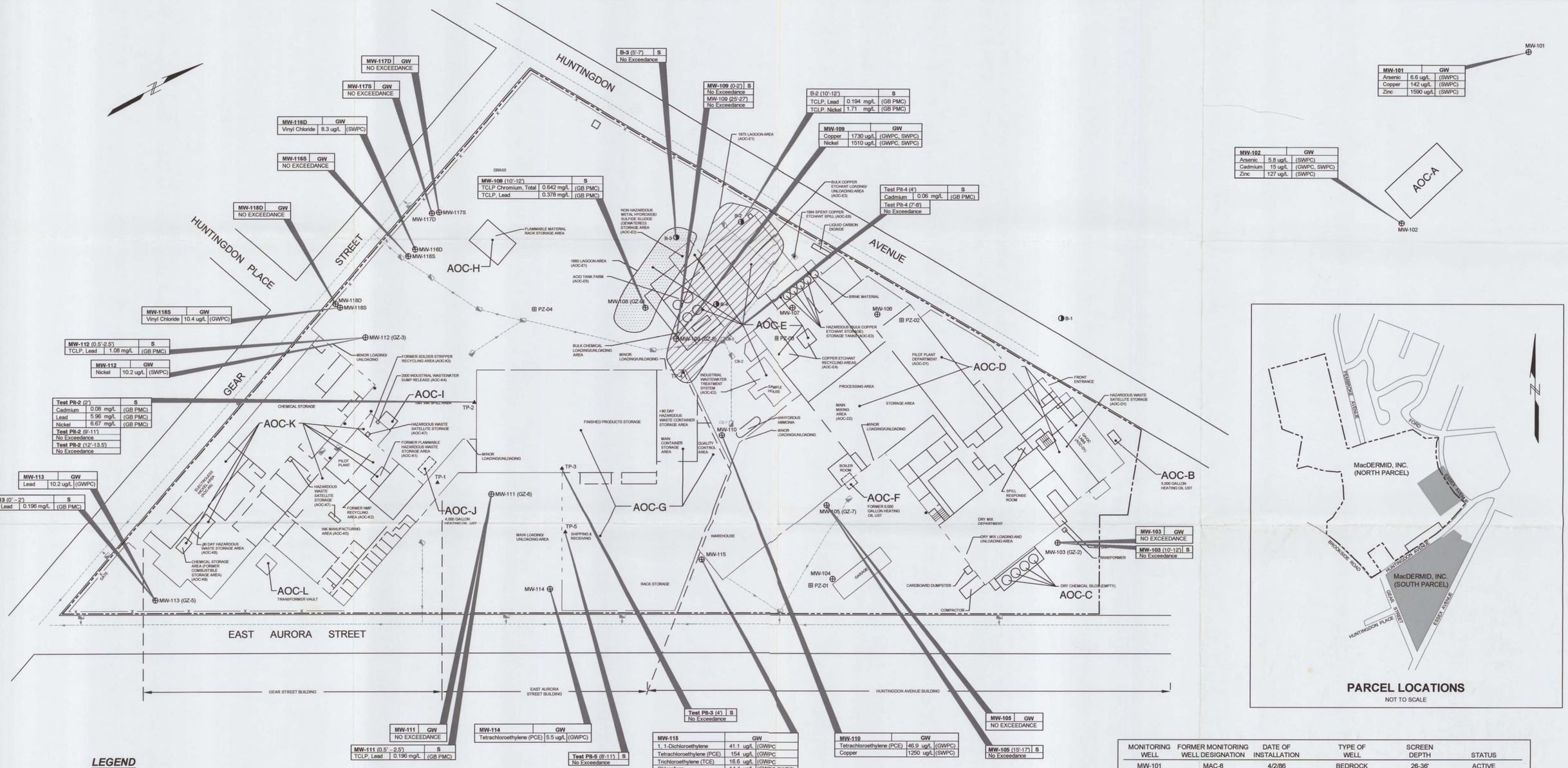
1.24.3 History of Releases, Investigations and Remediation

No documented releases to the surrounding environment are known to exist for AOC-L. Releases from this AOC may potentially occur if the structural integrity of the steel transformer is impacted.

1.24.4 Data Gaps

- Assess the presence of any cracks in the concrete and asphalt with penetrations to the subsoil which would allow contamination by constituents of concern.
- Evaluate the soil quality around the transformers to assess for the potential of a historical release.

Attachment 2



PARCEL LOCATIONS
NOT TO SCALE

LEGEND

- -GROUNDWATER MONITORING WELL
- -CATCH BASIN/STORM DRAIN
- -1995 TEST BORING
- -1985 SOIL TEST PIT (APPROXIMATE LOCATION)
- -1975 LAGOON AREA (APPROXIMATE LOCATION), AOC-E1
- -1980 LAGOON AREA (APPROXIMATE LOCATION), AOC-E1
- -PIEZOMETER

SAMPLE LOCATION

PARAMETER	MW-113	GW	SAMPLE MEDIA
	Lead	10.2 ug/L (GWPC)	CONCENTRATION / RSR CRITERIA EXCEEDED

GW = GROUNDWATER
S = SOIL
GWPC = GROUNDWATER PROTECTION CRITERIA
SWPC = SURFACE WATER PROTECTION CRITERIA

NOTE: GROUNDWATER SAMPLES COLLECTED MAY 2007.

SOURCE:

1. PLAN BASED ON MAP PREPARED BY HRP ASSOCIATES, INC., PLAINVILLE, CT TITLED *AREAS OF CONCERN (AOC) AND RSR EXCEEDANCES, MacDERMID, INC., 526 HUNTINGDON AVENUE, WATERBURY, CONNECTICUT,* DATED FEBRUARY 2005.

0 50 100
SCALE, FEET

MONITORING WELL	FORMER MONITORING WELL DESIGNATION	DATE OF INSTALLATION	TYPE OF WELL	SCREEN DEPTH	STATUS
MW-101	MAC-6	4/2/86	BEDROCK	26-36'	ACTIVE
MW-102	MAC-5	3/31/86	SHALLOW OVERBURDEN	22-32'	ACTIVE
MW-103	GZ-2	1/12/95	SHALLOW OVERBURDEN	25-35'	ACTIVE
MW-104	MAC-7	UNKNOWN	SHALLOW OVERBURDEN	UNKNOWN	INACTIVE (CLOGGED)
MW-105	GZ-7	2/15/95	SHALLOW OVERBURDEN	27-37'	ACTIVE
MW-106	MAC-4	UNKNOWN	SHALLOW OVERBURDEN	UNKNOWN	INACTIVE (LOST)
MW-107	MAC-3	UNKNOWN	SHALLOW OVERBURDEN	UNKNOWN	INACTIVE (CLOGGED)
MW-108	GZ-9	2/16/95	SHALLOW OVERBURDEN	25-35'	ACTIVE
MW-109	GZ-8	2/15/95	SHALLOW OVERBURDEN	25-35'	ACTIVE
MW-110	MAC-1	UNKNOWN	SHALLOW OVERBURDEN	UNKNOWN	ACTIVE
MW-111	GZ-6	1/13/95	SHALLOW OVERBURDEN	25-35'	ACTIVE
MW-112	GZ-3	1/13/95	SHALLOW OVERBURDEN	25-35'	ACTIVE
MW-113	GZ-5	1/13/95	SHALLOW OVERBURDEN	30-40'	ACTIVE

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AOC LOCATIONS AND SUMMARY OF GROUNDWATER AND SOIL ANALYTICAL DATA

December 2007 Figure 1

I:\GEI\MacDERMID\ MACDERMID SITE LAYOUT.dwg \Dec 27, 2007